This paper discusses the dimension of temperament, in addition to intellectual ability and motivation, as an integral aspect of the learning process in children. The relevance of this factor to the performance of children in school is discussed.

TEMPERAMENT AND LEARNING ABILITY OF SCHOOL CHILDREN

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ANY consideration of conditions affecting the learning ability of the school child must concern itself with a number of factors. It must be determined whether the demands made on the child are appropriate to his capacity. Is it within the child's power to master the specific learning task assigned to him? This is a fundamental issue that involves his over-all intellectual development, and is often summed up reasonably well by his performance on an intelligence test.

Specific areas of cognitive capacity are also crucial; for example, the child's development of language function, both verbal and written, must be up to the task expectancy in the classroom. His strengths and weaknesses in perceptual organization, ability to retain facts, or capacity to generalize must also be considered. It is essential to assess the relevance of the tasks demanded to the child's capacities in order to judge whether the curriculum is suitable, insufficiently challenging, or overly stressful. This area of concern may be called the "what" of learning.

A second major area of concern is the "why" of functioning, or motivation. Given a specific capacity to learn, the child's functioning will be influenced by his desire to learn. Many pertinent studies have investigated both the factors that motivate a child to learn per se and the factors that motivate a child to develop an interest in particular subjects. To these studies we may now add the interesting reports that indicate that the teacher's expectation of the child may often outweigh many other factors in influencing adequacy of performance.

This paper deals with the "how" of performances, namely the child's style of behavior as manifested in the classroom, and his responses both to the individuals that make up his learning situations and to the tasks required of him. I believe that far too little attention has been paid to individual patterns of behavioral style or temperament.

Fifteen years ago my co-workers, Dr. Alexander Thomas and Dr. Herbert Birch, and I became interested in the question of behavioral individuality in early childhood and the possible contribution of individual differences in reactivity to various aspects of the developmental process. At that time, however, we found that there was very little systematic knowledge about individual differences during infancy or their significance for psychological development.

True, the existence of marked individuality in both the spontaneous and reactive behavior of newborn infants was generally known to pediatricians, baby

nurses, and experienced parents. And a number of studies had indicated that certain individual differences that are potentially important for behavioral functioning are present at birth or shortly thereafter. But there had been few specific studies of such differences and, of these, most were investigations of a limited number of discrete areas of behavior such as sensory threshold (Bergman 1949), motility (Fries 1953), and perceptual response (Witkin 1962). For the most part, the samples used were not large enough to allow for a generalization of findings, and long-term studies that would permit an evaluation of the relevance of initial behavioral characteristics to later development were rare. Perhaps more important, methodologies for the collection and organization of data were inadequate, and no conceptual scheme which would lead to fruitful research and meaningful interpretation of findings had been validated.

We designed a longitudinal study that has followed two groups of children from birth up to the present. A combination of parent interviews, direct observations at home and in the classrooms, formal testing with detailed observations, and teacher interviews were used. The first group involved is comprised of 136 children of middle-class families with a high educational background. The second group consists of 95 children of working-class Puerto Rican families. To these studies have been added behavioral and educational evaluations of the brothers and sisters of the Puerto Rican children and a behavioral study of a group of 52 mentally retarded youngsters.

In all of these cases we have attempted to identify temperamental individuality and its influence on the youngster's learning process, both in general life situations and in formal learning situations. In this discussion I am drawing on these various research data.

Our longitudinal study has identified and described 9 categories of temperament. Briefly, these are:

1. Activity level: The motor component present in a given child's functioning, and the diurnal proportion of active and inactive periods.
2. Rhythmicity: The predictability of such functions as hunger, feeding pattern, elimination, and sleep-wake cycle.
3. Approach or withdrawal: The nature of the child's response to a new food, object, or person.
4. Adaptability: The speed and ease with which current behavior can be modified in response to altered environmental structuring.
5. Intensity of reaction: The energy level of response, irrespective of its quality or direction.
6. Threshold of responsiveness: The intensity level of stimulation required to evoke a discernible response to sensory stimuli, environmental objects, and social contacts.
7. Quality of mood: The amount of pleasant, joyful, or friendly behavior as contrasted with unpleasant, unfriendly behavior, or crying.
8. Distractibility: The effectiveness of extraneous environmental stimuli in interfering with, or in altering the direction of, ongoing behavior.
9. Attention span and persistence: These two categories are related. Attention span concerns the length of time a particular activity is pursued by the child. Persistence refers to the continuation of an activity in the face of obstacles to the maintenance of the activity.

A child's temperamental characteristics play a significant role in the nature of his functioning in school, because they affect both the manner in which he approaches the learning task and the way in which he interacts with other children and teachers. These temperamental qualities are in themselves neither positive nor negative in their consequences. They have, however, positive or negative implications both in relationship to certain demands made on the child and to the environmental organization in which these demands are made. We have found that a child makes

a positive adaptation to school and learns optimally when the demands are consonant with his temperamental style and with his organismic capacities. Conversely, learning is impaired when the demands are dissonant and become sources of stress. Let me illustrate this concretely.

Activity Level

In a classroom setting structured so that a six-year-old child is expected to sit still, listen to instruction, and carry out such directions as taking out paper and pencil, copying letters or numbers, or drawing a line from one point to another point on a picture as a means of showing his comprehension of a depicted scene, the characteristic level of a child's motoric activity may be an important component of his success or failure. Let us assume that we are dealing with a group of children of average or above-average intellectual capacity: whether a given child has understood the teacher's directions may depend on whether he was listening or moving about. The child who has a high-activity level wriggles, gets involved in activity with the classmate in front of him or behind him, falls out of his seat, plays with his pencils. He hears only the initial portion of the directions, may then get involved in trying to find out from his neighbor what he was supposed to do next, and finally may be scolded for being inattentive. In the most extreme instance of negative interactions of the highly active child with a classroom environment, the youngster soon decides that he is either stupid, bad, or both. He stops trying to keep up with the educational experience, and an educational block results. If the interaction with such a youngster is to be benign, the teacher must repeat the full directions pleasantly, avoid expressions of annoyance, and provide the child with constructive activity channels that may include tasks given at intervals during the day to keep his muscles moving. This temperamental quality is not likely to be a factor in school adaptation for the child with an average or low level of motility.

Approach or Withdrawal

The child with high approach ability responds positively to new stimuli, new people, places, toys, and learning demands. Other children may initially withdraw from all new situations, and be able to deal with them in a positive manner only after many exposures. Still another group of children may have selective responses to the new: they may approach new people but withdraw from new surroundings, be intrigued by strange toys but initially bewildered by learning demands. The child who "warms up slowly" may be unable to master the content of a new learning situation as quickly as his IQ indicates he should. When he is first presented with "carrying and borrowing" in arithmetic, or with a new book containing unfamiliar characters, he may lag behind the rest of the class. The teacher may incorrectly assume that he is incapable of mastering the material, even though the child's ultimate grasp would be better than that of classmates who learn more readily. If this temperamental quality is recognized by the teacher, and if the youngster is given an opportunity for repeated exposure to the new learning task without being made to feel stupid or being accused of noncooperation, he may learn to give himself a chance to familiarize himself with novel situations. He may become secure in the knowledge that he always misunderstands the material at first but just must give himself more time for re-reading and re-examination. One can see that the failure to permit such a child to perform in his own optimal style, which gives him a sense of dignity, could easily lead to his demoralization about the school situation.

Adaptability

The quality of high adaptability in a child will go far to counter his high withdrawal in a learning situation. Although an adaptable youngster may initially fail to engage in a new learning procedure, he may require only a few further exposures to become sufficiently comfortable with it to master its meaning, if this is within his intellectual capacity. By contrast, the child with slow adaptability coupled with a negative first reaction to a new scholastic demand will have a double difficulty. Highly planned handling may be needed to prevent discouragement on the part of the child, teacher, and parents. Discouragement tends to trigger a vicious cycle of interaction. The child avoids the subject matter. It is then assumed that his failure to learn is due to faulty motivation, which is actually a secondary phenomenon.

Intensity of Reaction

Some children invariably express their attitudes to stimuli in an intense manner. If interested, they are intensely interested; if happy, they are exuberant; if a new acquaintance strikes them negatively, they hate him; if a new teacher rubs them the wrong way, "she's a creep." They love science, hate math, and so on. Other children are characteristically mild in intensity. The onlooker trying to judge such a child by his facial expression or choice of adjectives might not guess from his comment that something interests him, that he, in fact, is about to move into a consistent involvement with a new subject at school, a friendship, or a hobby. For a teacher, a child's overt expression is the most prominent way of measuring his attitude. The teacher may not have become aware that in a given child, intensity is not the best measure for his purpose.

Thus a teacher may react to a child who is showing a passing expression of deep disgust by taking him too seriously and scolding, or the teacher, unaware that interest has been expressed, may fail to cultivate a child's interest in a particular subject. Teachers are often surprised when parents report that a youngster is spending a good deal of extracurricular time on a subject in which he seemed uninterested in school. Any misreading of signals may lead to inappropriate teacher response to the child, followed by the building up of negative interaction. Conversely, appropriate teacher handling may lead to optimal use of the child's intrinsic qualities.

Threshold of Responsiveness

Children vary greatly in their ability to discern stimuli. In the classroom, some youngsters are very quick to pick up nuances from the teacher's manner of presenting material. They respond to unspoken clues about what is deemed important and what is deemed peripheral.

In certain situations, a hypersensitive child may have such a low threshold to visual, auditory, or tactile stimuli that his attention is easily distracted from the ongoing business of the classroom. In certain subjects, such as art or music, this low threshold may actually enhance the child's involvement, but in arithmetic or geography the reverse is likely to be the case.

The child with low threshold to nuances may be the one who always seems to know "what the teacher wants us to say on the test." The child with high threshold may be the one who feels fate is against him because he always seems to decide incorrectly that "the teacher isn't going to ask that." Such a child may spend all his time on what he considers the central point only to find that it takes up 1/20th of the total examination. If equality of instruc-

tion is to be provided, the child who has a low threshold may need less detailed explanations of central learning issues than the child who has a high threshold. On the other hand, a child with high threshold may require repetition of the learning stimulus before he has actually received the same message as his neighbor.

Quality of Mood

A teacher finds it more agreeable to instruct a good-humored youngster than one who is characteristically unfriendly, unpleasant, and/or unhappy. The pleasant child is likely to have more positive experiences with the teacher than the youngster with negative mood will have. The first child can ask questions and receive a cordial reply, and can even indicate a failure to understand a whole sequence of learning without being scolded for not studying. The child who is characteristically cantankerous and carping will not ordinarily evoke the teacher's desire to extend herself in his behalf. The teacher is more likely to feel that this is a child who should be put in his place, whose disagreement with the teacher's point of view is to be reprimanded rather than explored and complimented as an example of independent thinking. Thus the child whose quality of mood is positive is likely to have classroom interactions that reinforce this aspect of his personality. The child with negative mood is likely to feel "picked on" and find constant confirmation of his feeling that a negative response is needed for a negative world.

Distractibility

This quality may have the greatest influence on the child's success or failure in a clasroom. The highly distractible child may be aware of extraneous stimuli going on, the principal passing the door, a classmate sneaking a look at a comic book, a friend sporting a particularly classy belt. For another child, the same stimuli may remain peripheral.

Since the distractible child is also frequently the child with a high activity level, his distractibility is often shown in motoric ways. However, the two characteristics are not always joined. A motorically quiet child may be highly distractible. Even though he may sit quietly in class, his mind is nevertheless engaged in all sorts of side issues.

It is a great demand on a teacher to be aware of such a quality. Yet the conscientious teacher must recognize that the distractible youngster may hear only a part of the classroom instruction, and later be bewildered by what is going on. It is necessary to distinguish between temperamental and motivational qualities that interfere with learning. The highly distractible child is not deliberately failing to listen.

The child who has low distractibility has an asset in most classroom situations, but in its extreme form this quality may also be a liability. The child may not be sufficiently aware of stimuli and may miss the richness of the subject he is learning. One should be aware that high distractibility merely means responsiveness to stimuli. From the social point of view, the child with high distractibility may have capacities for social sensitivity, empathy, and constructive behavior. These social assets are very much to be prized. Indeed, a teacher who is annoyed with a child because he is so easily distracted from the learning task may often count on this child to make a new and frightened member of the class feel at ease.

Attention Span and Persistence

These two qualities are discussed as a unit. For most learning purposes, long attention span and marked persistence are assets. The ability to become engaged for long uninterrupted periods in

a learning task usually makes for mastery of the subject matter. Conversely, short attention span and low persistence may result in a child withdrawing his attention from a topic before he has made much headway in it.

However, an unusually long attention span may present its own problems. A child may become so annoyed at having his attention pulled away from his chosen task that he loses perspective about the needs of the classroom situation. Depending on his other temperamental qualities such a child may ignore the teacher, have a tantrum, sulk, run away, or use great effort to pull himself away from what he is doing. It is important for a teacher to identify persistence as a quality of reactivity rather than identify it as mere stubborness. The persistent child is not willfully setting himself up in judgment of the teacher.

In our studies we found that temperamental qualities have a tendency to be present in clusters. For example, we note that mild negative responses to new stimuli are often combined with slow adaptability after repeated contact. We refer to children with this constellation as "slow-to-warm-up."

A key issue in their development is whether parents and teachers allow them to adapt at their own tempo or insist on immediate positive involvement, a feat that is difficult or impossible for them. If the child's slow adaptation to a new school, new peer group, or new academic subject is recognized as his normal temperamental style, the adult is likely to be patient and offer encouragement. If, on the contrary, the child's slow warm-up is interpreted as timidity or lack of interest, the adult tends to be impatient and places pressure on the child for quick adaptation. The child typically reacts to this stressful pressure by an intensification of his withdrawal tendency. In turn, the increased holding back stimulates even greater impatience and pressure on the part of the parent or teacher. A destructive process of interaction between child and environment is thus set in motion.

In several instances in our study population, nursery school teachers have interpreted the child's slow initial adaptation as evidence of underlying anxiety. One elementary school teacher attributed a child's slow initial mastery of a new accelerated academic program to inadequate intellectual capacity. In all these cases, the longitudinal behavioral records documented a slow-warm-up temperamental style and made possible the recommendation that judgment be suspended until the child could have a longer period of contact with the new situation. The child's subsequent mastery of the new demands clarified the issue as one of temperamental style rather than lack of intellectual capacity or psychopathology.

Another constellation, similar in many ways to the one just described, characterizes what we call "the difficult child." Children with this pattern also give negative responses to new stimuli and show slow adaptability after repeated contact. But in contrast to the previous group, they react with high intensity. Their withdrawal is not quiet. They do not appear to be like "the shy child"; rather their reactions tend to be disruptive and to interfere with the work of their classmates. This temperamental pattern generally produces the greatest risk of behavioral problem development and the children who manifest it are vulnerable to negative interaction in the classroom. In these children, frustration characteristically produces a violent tantrum. They get angry at the task which they cannot master quickly, and feel "picked on" by teachers who give such tasks. New learning procedures may fill them with dismay. Once they do learn the rules or become familiar with the new learning task, they function easily, consistently, and energetically. The risk

period occurs during the long adaptation. Teachers quite understandably tend to single out such children for scolding, and, anticipating trouble, be more peremptory with them, thus adding to their adaptive stresses.

A third constellation, characterizing what we call "the easy child," surprisingly also presents behavioral vulnerabilities that affect learning capacity. "The easy child" is regular, responds positively to new stimuli, adapts quickly to change, and shows a predominantly positive mood of mild or moderate intensity. These are the infants who easily develop regular sleep and feeding schedules, take to a new school, accept most frustrations with a minimum of fuss, and learn the rules of new games quickly. By contrast to "the difficult infant," "the easy child" adapts to the demands for socialization with little or no stress, and confronts his parents with few if any problems in handling. However, although these children do, as a group, develop significantly less behavior problems proportionately than do "the difficult infants," their very ease of adaptability may under certain circumstances be the basis for the development of problem behavior. This occurs most typically when there is a severe dissonance between intra- and extrafamilial environmental expectations and demands. The child adapts easily to the standards and behavioral expectations of the parents in the first few years of life. When he moves actively into functional situations outside the home, such as in peer play-groups and school, stress and malfunctioning will develop if the extrafamilial standards and demands conflict sharply with the patterns learned in the home.

As a typical example, the parents of one such child had a high regard for individuality of expression and disapproved of any behavior or attitude in their child which they identified as either stereotypical or lacking in imagination. Self-expression was encouraged, conformity and attentiveness to rules imposed by others discouraged, even when this resulted in ill manners and disregard for the desires of others. As the child grew older, she became increasingly isolated from her peer group because of her continuous insistence on her own preferences. In school her progress was grossly unsatisfactory because she had difficulty in listening to directions. The parents were advised to restructure their approach, so that they placed less emphasis on individuality and instead stressed responsiveness to needs of others and constructive conformity in both classroom behavior and activities with peers. The parents, acutely aware of the child's growing social isolation and the potential seriousness of her educational problem, carried out this plan consistently. At follow-up, six months later, the child had adapted to the new rules easily, the conflict between standards within and without the home had become minimal, and she had become an active member of a peer group and had reached grade level in academic work.

In a recent psychiatric study of children with poor school achievement, Ross (1966) suggests that the combination of high distractibility, short attention span, and low persistence in interaction with an overpermissive or disorganized environment may lead to a specific type of behavioral disturbance which he calls "the unorganized child." He also suggests that specific manifestations of this syndrome will depend on whether the above temperamental qualities are combined with high or low activity level, and intense or mild mood response.

Attention to temperament may add to our understanding of some types of school avoidance, including that which has a truly phobic quality. In clinical practice, I have found this to be the case. For the "slow-to-warm-up child" or "the difficult child," initial school experiences may be crucial. They can give

him the firm conviction that school is a frightening and traumatic situation which confronts him with kaleidoscopic demands that are impossible for him to meet. This negative experience may be modified if the child is given an opportunity to adapt slowly while a minimum number of changes and new demands are introduced. He may learn that although he is bewildered or made to feel strange by a new situation, he eventually not only masters it but gains a great deal of pleasure from it. With the negative interaction, however, the child can develop anxiety and may either never achieve a positive interaction or may have an increased vulnerability to later negative interaction.

For example, I was requested to act as consultant for a 14-year-old girl who was failing most of her subjects in her first year of high school despite an IQ of 135, and shortly thereafter I also was consulted about her brother. The parents were concerned about possible stress to the son because of the discrepancy between his 120 IQ and his top-of-class performance in an academically demanding private high school. The boy showed a lack of gregariousness. Thus one child in the family was, by their definition, underachieving and the other was overachieving. As I examined the temperaments of these two youngsters, a missing dimension came to light.

The girl, Claudia, had hosts of friends with whom she spoke for hours on the telephone, was interested in cooking and dressmaking, and also loved to go to parties. Her parents approved of her friends, but disapproved of the large amount of time she spent in socializing, particularly when they contrasted this to the meager allotment given to study. When I went back to Claudia's early childhood I found that she had always been sociable and very responsive to people. In addition, she had always been easily distractible and had a short attention span. Her lack of interest in academic subjects and her flair for the social could be seen as a continuum of the early temperamental traits. Had she lived in the Victorian era, she would have been a model woman. Her family was very education-oriented. Her mother, who had had to struggle and make sacrifices for her own education, was somewhat taken aback by her daughter's disdain for the educational opportunities handed to her. There were no pathological features in the girl, and no other complaints.

The 16-year-old brother, in contrast, had always been a persistent child who became deeply involved in ongoing activities. From earliest childhood, this youngster had been intrigued by problems, particularly conceptual ones, and tended to remain involved in his problem-solving activity until he either came up with a solution or was convinced that finding the answer was beyond him. His friends, who had learned this about him, tended to drag him away when they could. As he explained, "it was fun being with friends," but if he were busy working or studying, he preferred to finish the task. His friends did not get angry at him because they "knew how he was." There was no evidence of stress. He was not driven by a sense of competition. His friends respected his temperament. He went on, incidentally, to be the valedictorian of his graduation class and achieved the college dean's list; he still enjoyed both himself and the academic challenge. While the relationship between temperament and school performance is not usually so obvious, the facts about these two children nevertheless serve to illustrate this area. In remedying such a situation, one must understand the role of the child's temperamental reactivity and attempt to use it as one's ally rather than as a hostile force.

To conclude, in some circumstances the child's overall intellectual ability is the decisive factor in a specific learn-

ing disability. In other situations, the pin-pointing of problems of motivation may provide the key for an understanding of the student's difficulty and the organization of a remedial plan. I have emphasized the significance of a third factor, the child's temperamental organization. Even in cases where the cognitive or the motivational element is the primary issue, the implementation of an appropriate remedial or therapeutic plan may depend upon taking the patient's temperamental individuality into account. This dimension of temperamental individuality must be recognized as an integral part of the learning process.

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